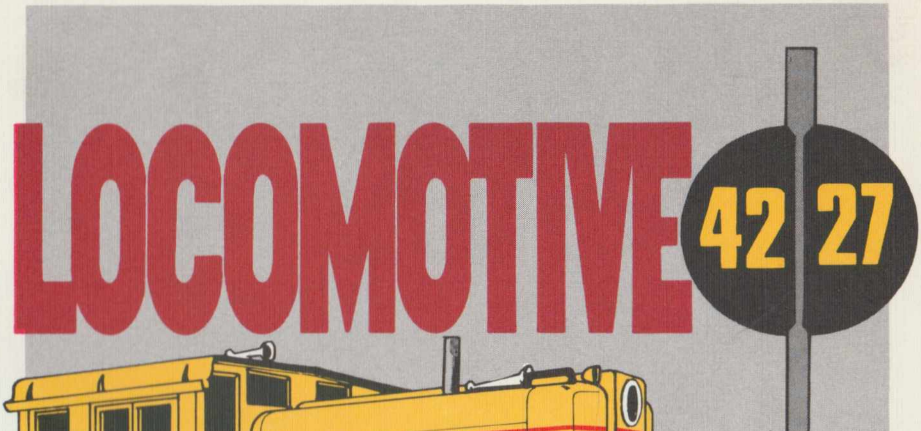
LOCOMOTIVE SWITCHER



LOCOMOTIVE SWITCHER

INTRODUCTION

Who doesn't want to be a railroad engineer? In LOCOMOTIVE SWITCHER the engineering and programming staff at SIGNAL COMPUTER CONSULTANTS have brought an operating railroad layout to the computer screen. From your computer keyboard you have complete control over a switch engine and seven freight cars. Your "MICROlayout" consists of a section of mainline track, six switches and seven loading areas. Controlling switch alignment from the keyboards you can move the train to any location in the "yard."

Realistic train and car movements are achieved through sophisticated car-motion logic that simulates car deceleration to a degree not possible on "real" model layouts – even car weight is factored in.

LOCOMOTIVE SWITCHER operates in two modes. As a FLAT YARD cars are pushed into the layout ahead of the switch engine and placed (spotted) at any of the seven loading docks. Cars in the yard are pulled out to the mainline.

If HUMP YARD mode is chosen, a HUMP CREST is placed at the yard entrance. As cars are pushed over the crest they uncouple and roll on their own through the yard.

The objective of LOCOMOTIVE SWITCHER is to move every car to its assigned location quickly, efficiently and safely. Initial and final car locations may be assigned by the computer, or the operator may choose to set up problems to be solved.

Operator performance is tracked. A scoring screen is displayed at the end of each shift showing number of cars spotted, number of train moves, damage to cars and operating time.

GETTING STARTED

Place the enclosed template (Figure 1) on the computer keyboard and review the key assignments. Clockwise, from the top, the most used controls are:

1 & 2 Set train direction to FORWARD or REVERSE
3 Sets switch to NORMAL
4 Sets switch to REVERSE
5 TRANSMITS a command
6 THROTTLE increases train speed
7 BRAKE slows train

These seven controls permit you to move the train to any location on the screen layout.

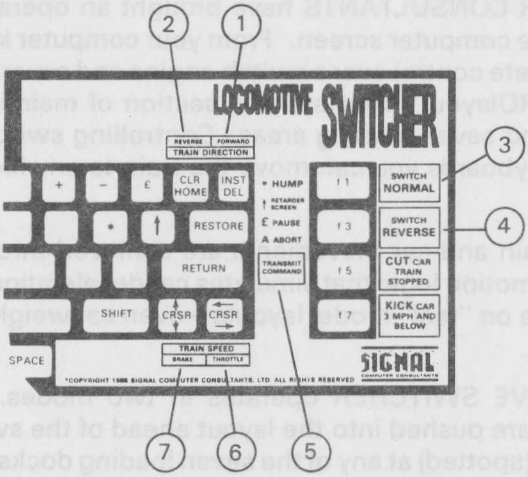


Figure 1. KEYBOARD TEMPLATE

DISK

Turn on your C-64 computer, monitor or TV, and disk drive. Place the LOCOMOTIVE SWITCHER diskette in the disk drive (label side up) and close the drive door.

To load LOCOMOTIVE SWITCHER type:

```
LOAD"LOCO",8 (RETURN)
```

When the prompt "READY" appears, type:

```
RUN (RETURN)
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CASSETTE

Turn on your C-64 computer and monitor or TV. Place the Locomotive Switcher cassette in the datasette, label side up. Rewind if necessary. Type LOAD, press the RETURN key, and press PLAY on the datasette. Loading requires about 8 minutes.

When the prompt "READY" appears, type RUN and press the RETURN key.

SELECTION SCREENS

Following display of the title screens the main program will load from disk or tape. When loading is complete the first selection screen is displayed.

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Press "1" to play the FLAT YARD version or "2" to operate the HUMP YARD.

The second selection screen gives you the option to either assign car locations or permit the computer to assign them.

Press "N" to go directly to the LAYOUT screen.

The main features on the LAYOUT screen are identified in Figure 2. You may wish to briefly examine Figure 2 before moving on to the step-by-step operating instructions.

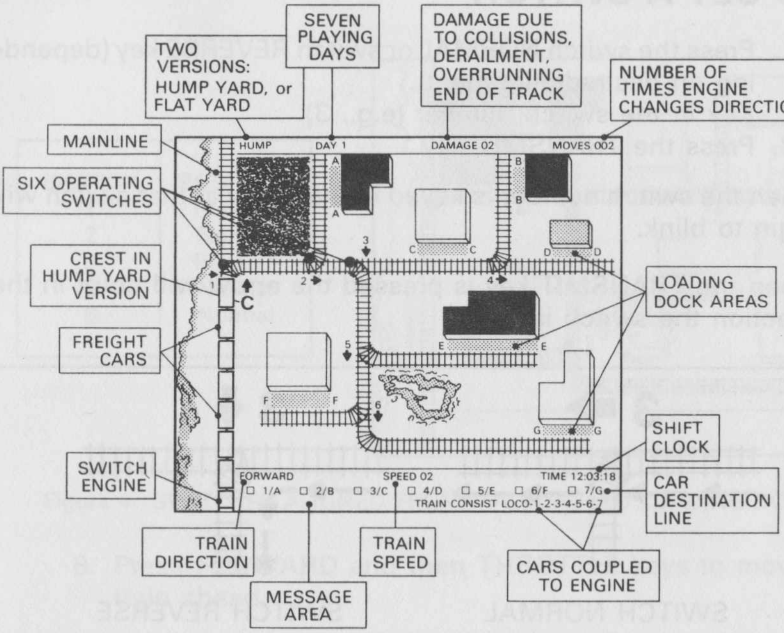

Figure 2. LOCOMOTIVE SWITCHER LAYOUT

OPERATING INSTRUCTIONS

If you have successfully loaded the program and worked your way through the two selection screens, the layout will be displayed and you hear the rumble of the diesel switch engine at idle. Aided by the Keyboard Template, you may have figured out how to move the train, throw switches, and possibly uncouple cars. Experimentation is encouraged. However, at some point you will want to learn how to use all the operating features. The directions which follow introduce LOCOMOTIVE SWITCHER operating procedures in step-by-step fashion. Their presentation sequence is:

Setting Switches
Moving the train
Uncoupling cars ("cutting" and "kicking")
Running the HUMP YARD

The final section describes Performance Scoring. ENJOY!

TO SET A SWITCH

1. Press the switch NORMAL or switch REVERSE key (depending on desired alignment).
2. Key in the switch number (e.g., 3).
3. Press the TRANSMIT key.

When the switch number is keyed in the arrow at that switch will begin to blink.

When the TRANSMIT key is pressed the arrow will point in the direction the switch is set.

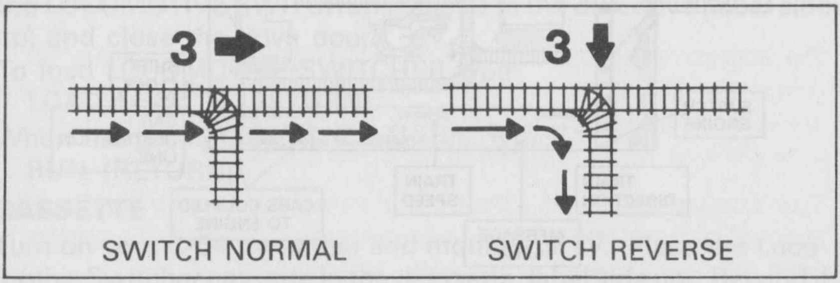

Figure 3. SWITCH ALIGNMENT

TO MOVE THE TRAIN

With the train stopped on the mainline and the last car below switch 1:

1. Press the FORWARD direction key.
   (Train direction is displayed near the bottom left corner of the screen)
2. Press the THROTTLE key.
   (The train will begin to move up. Speed is displayed at bottom center of the screen)

To increase speed hold the THROTTLE key down. To decrease speed press and hold down the BRAKE key.

3. The train will follow the path set by the switches.
4. Press and hold down the BRAKE key.
   (This slows and stops the train)
5. When the train has stopped, press the REVERSE key.
6. Press the THROTTLE key.
   (The train will begin to move in the opposite direction)
7. Slow and stop the train again by pressing the BRAKE key.

To move the train from the mainline to station G align (set) the switches as follows:

SWITCH	POSITION
1	Reverse
2	Normal
3	Reverse
5	Normal
6	Normal

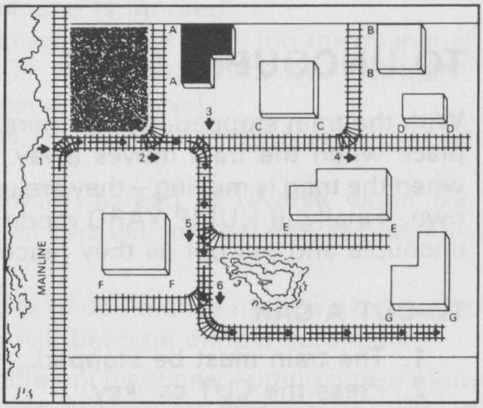

Figure 4. SWITCHES ALIGNED FROM MAINLINE TO LOADING DOCK G

8. Press FORWARD and then THROTTLE keys to move the train ahead.

Remember: A switch engine works from the back of the train, pushing cars ahead of it. You will soon get used to having the engine at the "wrong" end of the train.

9. If the switches are aligned as described above the train will move to STATION G at the bottom right corner of the screen.
10. Slow the train to 3 MPH or less before the end of the track at G is reached.

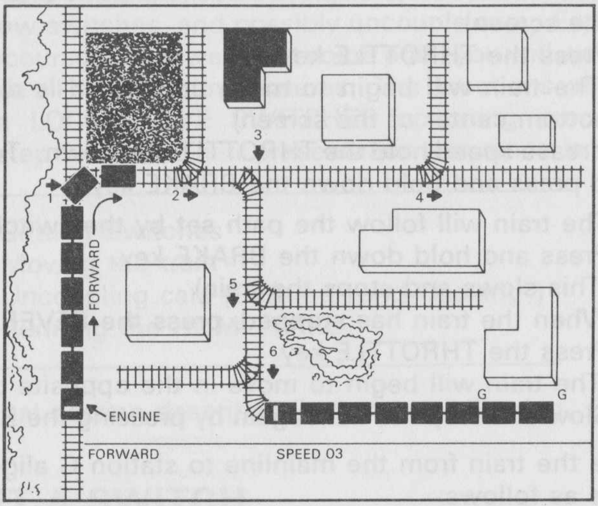

Figure 5. TRAIN MOVING FORWARD

TO UNCOUPLE CARS

With the train stopped, one or more cars may be "cut" and left in place when the train moves away. Also, cars may be "kicked" when the train is moving – they are uncoupled and roll out on their own. Finally, if HUMP YARD mode has been selected, cars will uncouple and roll out as they reach the CREST of the Hump.

TO CUT A CAR

1. The train must be stopped.
2. Press the CUT car key.
3. Key in the number of cars to be cut.
4. Press the TRANSMIT key.
5. Press the REVERSE (train direction) key.
6. Press the THROTTLE key.

The train will move away from the cut car (or cars). The following "rules" apply when cutting a car:

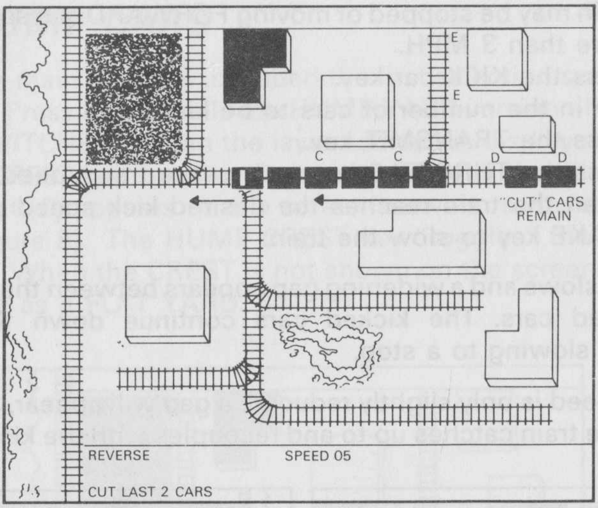

Figure 6. TWO CARS CUT.
TRAIN MOVING IN REVERSE

1. If the train is not stopped, the message "TRAIN NOT STOPPED" is displayed and the cut command is ignored.
2. If you try to cut more cars than are in the CONSIST (attached to the engine) the message "ILLEGAL NUMBER OF CARS" is displayed and the command is ignored.
3. If you try to cut cars that are off the screen (on the mainline) the message "CAN NOT CUT/KICK CARS OFF SCREEN" appears and the command is ignored.
4. If you forget to press the TRANSMIT key the cars will not be cut.
5. If the train moves forward instead of reverse when the throttle is pressed the cut cars will immediately recouple to the train.

With a little practice this series of commands may be executed in about 2 seconds, and soon will become almost automatic.

Practice moving the train to different locations, cutting one or more cars and then moving the train away. Note that any car (except when derailed) may be coupled up to the train again simply by moving the train to it.

TO KICK A CAR

Kicking a car (or cars) is much like cutting cars except it is done while the train is moving. Kicked cars keep moving after the train slows.

1. Train may be stopped or moving FORWARD at a speed of no more than 3 MPH.
2. Press the KICK car key.
3. Key in the number of cars to be kicked.
4. Press the TRANSMIT key.[1]
5. Press the THROTTLE key to increase train speed.
6. When the train reaches the desired kick speed press the BRAKE key to slow the train.

The train slows and a widening gap appears between the train and the kicked cars. The kicked cars continue down the track, gradually slowing to a stop.

If train speed is only slightly reduced, a gap will appear, then narrow as the train catches up to and recouples with the kicked cars.

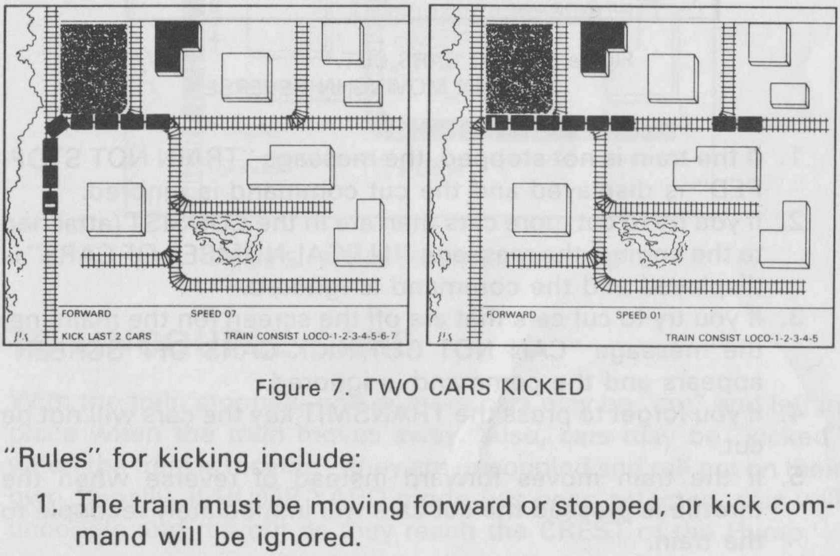
FORWARD
SPEED 07
KICK LAST 2 CARS
TRAIN CONSIST LOCO-1-2-3-4-5-6-7
FORWARD
SPEED 01
TRAIN CONSIST LOCO-1-2-3-4-5

Figure 7. TWO CARS KICKED

"Rules" for kicking include:

1. The train must be moving forward or stopped, or kick command will be ignored.
2. The train must not be moving faster than 3 MPH, or the message "SPEED TOO HIGH TO PULL PIN" will appear when the TRANSMIT key is pressed and the command will be ignored.
3. Cars off the screen may not be kicked.
4. Trying to kick more cars than are in the train CONSIST will display "ILLEGAL NUMBER OF CARS" and the command ignored.

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[1] Note that when the TRANSMIT key is pressed the CONSIST shows the kicked car numbers in black. Then, when the train slows and the kicked cars roll away, the kicked cars are deleted from the CONSIST.

TO HUMP CARS

After the main program is loaded the first selection screen is displayed. Pressing "2" calls the HUMP YARD version of LOCOMOTIVE SWITCHER. When the layout screen is displayed press the HUMP CREST key to set up the layout as a small classification yard. The crest (C) appears on the screen between switches one and two (Figure 8). The HUMP CREST key "toggles" the CREST on and off. When the CREST is not shown on the screen the layout operates as a FLAT YARD.

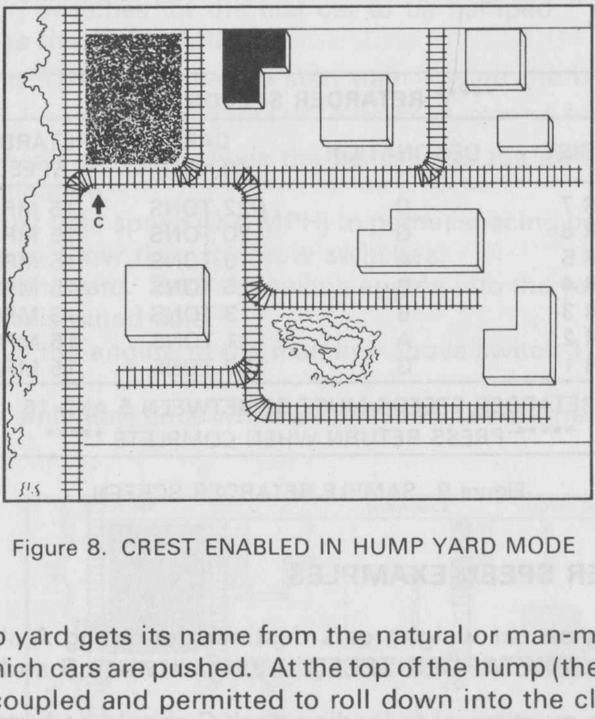
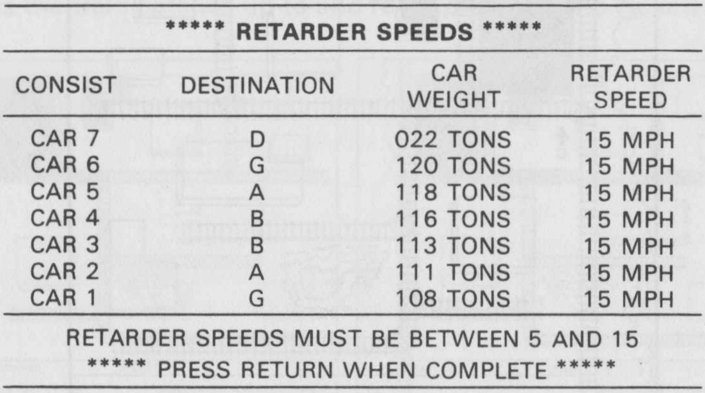


Figure 8. CREST ENABLED IN HUMP YARD MODE

A hump yard gets its name from the natural or man-made mound over which cars are pushed. At the top of the hump (the crest), cars are uncoupled and permitted to roll down into the classification "bowl." Each car is sent to one of several tracks where a new train is being made up. Each car is routed to the correct location (hopefully!) by an operator in a tower near the hump who controls the switch settings ahead of the rolling cars.

Because cars roll at different speeds (mainly due to weight differences) and some must travel farther than others, speed must be controlled as well. This is done by RETARDERS placed at strategic locations in the yard. A retarder is a large machine placed next to the tracks that applies braking action by squeezing the wheels of cars passing through it. Pneumatic controls vary the force applied, allowing different braking for each car. In LOCOMOTIVE SWITCHER the speed of cars leaving the hump can be controlled. Press the RETARDER Screen key to display the CONSIST. For each car currently coupled to the train CAR WEIGHT is set by the computer and will range between 20 and 120 TONS. Initially, all RETARDER SPEEDS are set to 15 MPH. Any car RETARDER SPEED may be changed by using the CURSOR keys to move the black square to the number to be changed and then pressing the numeric keys to enter the desired speed. The range of permitted speeds is 5 to 15 MPH. You may NOT exit the RETARDER Screen until all speeds are within this range. Press the RETURN key to exit the RETARDER Screen.



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                 ***** RETARDER SPEEDS *****

                                    CAR          RETARDER
CONSIST         DESTINATION        WEIGHT          SPEED

CAR 7               D            022 TONS        15 MPH
CAR 6               G            120 TONS        15 MPH
CAR 5               A            118 TONS        15 MPH
CAR 4               B            116 TONS        15 MPH
CAR 3               B            113 TONS        15 MPH
CAR 2               A            111 TONS        15 MPH
CAR 1               G            108 TONS        15 MPH

        RETARDER SPEEDS MUST BE BETWEEN 5 AND 15
          ***** PRESS RETURN WHEN COMPLETE *****
```

Figure 9. SAMPLE RETARDER SCREEN

RETARDER SPEED EXAMPLES

Depending on car weight, cars destined for siding A should be humped at a RETARDER SPEED setting between 6 and 8 MPH.

Cars which must travel to loading dock G should be humped at a RETARDER speed of 13 to 15 MPH.

RETARDER SPEED settings that are too high will cause cars to be damaged or derail, or may cause cars to catch up to cars humped ahead of them. Cars moving too slowly will not reach their destinations.

TO RUN THE HUMP YARD

1. Select HUMP YARD option after loading.

2. (If desired) select and set car INITIAL positions and DESTINATIONS.
3. The LAYOUT Screen will display with cars in their initial positions.
4. Press the RETARDER Screen key to call up the CONSIST showing CAR WEIGHTS and RETARDER SPEEDS.
5. For each car, select and set RETARDER SPEED, based on destination and car weight.
6. Press the RETURN key to recall the LAYOUT Screen.
7. Press the HUMP CREST key to display the HUMP CREST.
8. Set Switch 1 to REVERSE (and press TRANSMIT key).
9. Align switches for the first car to be humped.
10. Press the FORWARD key.
11. Press THROTTLE key to start train toward the hump.

    NOTE: Train speed must not exceed 4 MPH or cars will not uncouple at the HUMP CREST.

12. As each car approaches the hump align the switches for its destination.
13. Adjust train speed (0-4 MPH) to permit spacing between cars and to allow time to throw switches.
14. Trim the yard. Take the switch engine into the yard to "spot" any misrouted cars.
15. Move the engine to the mainline above switch 1 (see Figure 10).
16. The shift (day) ends when all cars have been correctly spotted

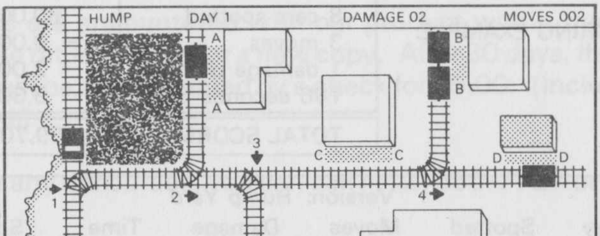

Figure 10. ALL CARS SPOTTED

and the engine returned to the mainline above switch 1.

17. If, because of derailments blocking the track, all cars cannot be spotted to their assigned destinations it may be necessary to end the shift by pressing the ABORT key.

PERFORMANCE SCORING

Performance is tracked and reported for up to 7 shifts (days).

Scoring factors are:

SPOTTED	10,000 points are awarded for each car (including locomotive) correctly placed. Maximum 80,000 points.
MOVES	3,000 points are deducted for each train move. One move consists of a pair of direction changes.
DAMAGE	2,000 points are deducted for each damage point. Damage occurs when: • a car reaches the end of a track at a speed greater than 5 MPH • cars recouple at a speed greater than 7 MPH • a car derails (5 damage points). Derailments occur when car-to-car speed exceeds 11 MPH, or car-to-end-of-track speed exceeds 9 MPH.
TIME	50 Points are deducted for each second of operating time (or 3,000 points per minute).

SCORING EXAMPLE:

FACTOR	POINTS
8 cars spotted	80,000
3 moves	− 9,000
1 damage point	− 2,000
186 seconds time	− 9,300
TOTAL SCORE	59,700

Version: Hump Yard

Day	Spotted	Moves	Damage	Time	Score
1	8	3	1	186	59700
2	8	4	8	263	38850
3	7	2	1	118	56100
4	8	2	0	100	69000
5	8	2	3	150	60500
6	8	2	2	102	64900
7	8	2	1	102	66900
Tot	55	17	16	1021	415950
Avg	8	2	2	146	59421

Figure 11. SAMPLE SCORING SCREEN

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